



**INDIAN RAYON**  
 ( a Unit of Aditya Birla Nuvo Ltd. )  
 (RAYON DIVISION)  
 VERAVAL



### Unit Profile

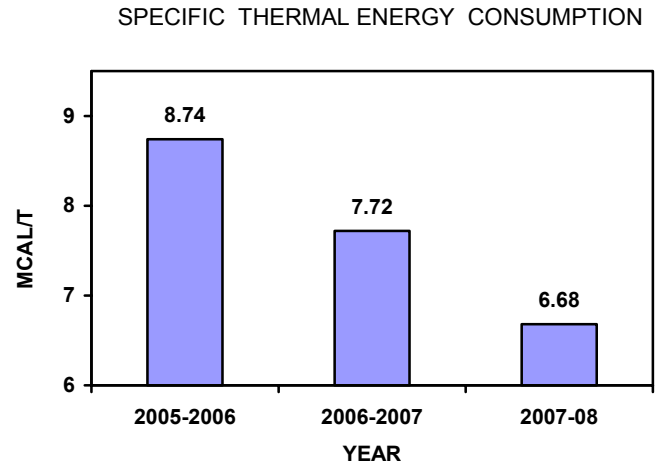
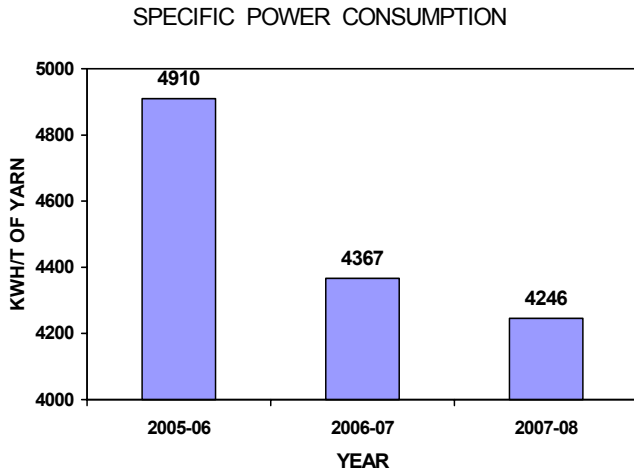
Indian Rayon (a Unit of Aditya Birla Nuvo Ltd.) is an acknowledged market leader of VISCOSE FILAMENT YARN business. The Rayon division is one of the 8 divisions of Indian Rayon, located in Veraval Gujarat. The main product of Rayon division is the Viscose Filament Yarn apart from chemicals like SULPHURIC ACID, CARBON DISULPHIDE which are consumed in house and SODIUM SULPHATE, which is a by product. The total Production capacity is 45.0 TPD of Yarn. Comprising 40 TPD pot spun yarn (PSY) & 5.0 TPD Continuous Spun Yarn (CSY). During the year 2007-2008, 17000 MT of yarn was produced with the capacity utilization of 103.65 % . The Veraval unit's annual sale turnover was Rs. 364.14 crores in the same year.



### Energy Consumption

With the implementation of various energy conservation measures as ongoing practice, there is steady decline of specific energy consumption. Last three years specific energy consumption figures are shown below , Which depicts continual reduction in energy consumption over last two years due to our sustained efforts to conserve it with the implementation of various energy conservation measures & ideas to increase efficiency of equipments. In spite of drastic increase in the cost of purchased Electricity and fuel the cost of Energy as percentage of total manufacturing cost reduces continuously due to the commitment from management and the extensive efforts made by the plant team for Energy Conservation.

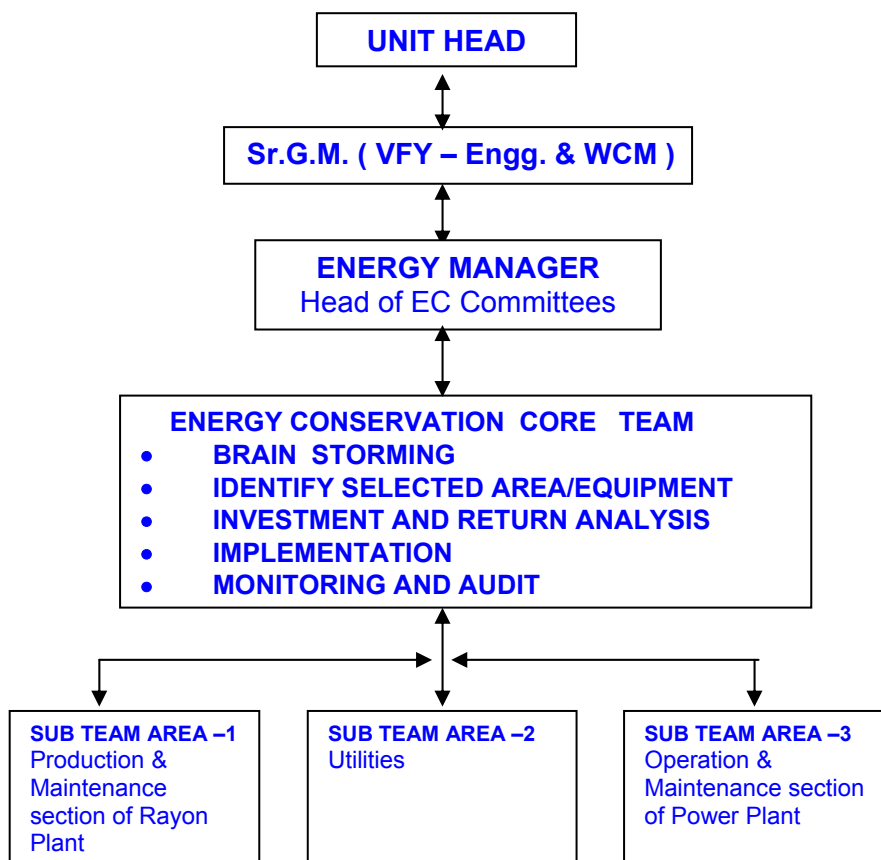
DESCRIPTION	UNIT	2005-06	2006-07	2007-08
Electrical Energy	KWH/T	4910	4367	4246
Thermal Energy	M Kcal/T	8.74	7.72	6.68
Total Manufacturing Cost	Rs. lakhs	22099	25574	27220
Total Energy Bill	Rs. lakhs	4101	4028	4122
Energy as %age of Total Cost of Production	%	18.56	15.75	15.14



**Energy Conservation Commitment, Policy and Set up**

Indian Rayon visualized importance of energy conservation way back in 1990. Since then we have been involved in continuous improvement & energy conservation. Our Core team led by unit head & headed by Energy Manager constitutes 11 nos. of subcommittees in the plant. Subcommittee consist 2 to 4 members from different areas. All the team meets periodically for review & implementation of new identified energy saving schemes. At Indian Rayon, energy cost accounts 15 to 20% of production cost and the unit gives utmost importance to energy conservation

**ENERGY CONSERVATION TEAM STRUCTURE**





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(RAYON DIVISION)  
**VERAVAL**



## **ENERGY MANAGEMENT POLICY**

Indian Rayon, a Unit of Aditya Birla Nuvo Ltd., Veraval is committed to demonstrate excellence in Energy Management Performance on a continual basis.

To achieve this, we are committed for-

- Monitoring and Control of consumption of Energy through effective Energy Management System and periodic energy audits.
- Continuous Upgradation of process with energy efficient & eco-friendly technology to optimize the energy cost.
- Promoting & Propagating Energy Awareness among all the employees.
- Bench marking our performance with the best and endeavoring to be ahead in the world.

( Rahul Mohnot )  
**PRESIDENT**

## Energy Conservation Achievements

During the period 2005 - 2008, the unit implemented 92 energy saving ideas generated through periodic brain storming sessions. Annual savings of Rs.516.51 lakhs was achieved with an investment of Rs. 350.43 lakhs with payback period of approx. eight months only. It has resulted in percentage reduction of 13.52 % in electrical energy and 23.57% in thermal energy during last 3 years shown below.

YEAR	PRODUCT	KWH/TONNE	%REDUCTION OVER 2005-06	MKCAL/ TONNE	%REDUCTION OVER 2005-06
2005-06	Viscose filament Yarn	4910	-	8.74	-
2006-07	Viscose filament Yarn	4367	11.06	7.72	11.67
2007-08	Viscose filament Yarn	4246	13.52	6.68	23.57

### Major projects implemented for Energy conservation during 2007-08

#### 1. Installation of Variable Frequency Drives in Fresh Air Fans of Spinning & Textile halls (Trend Setter Project )



We have installed Variable Frequency Drives in place of ordinary Star delta Starters on all the 19 Nos Fresh Air Fans of our Spinning & Textile hall. Speed of all these fans are controlled by changing the frequency of VFD as per the fresh air requirement by measuring the DB, WB Temp & %RH.

Power saving: 6.23 lakh kwh per annum

Investment: Rs. 43.20 lakh

Saving: Rs. 34.25 lakh per annum

**2. Installation of One No. 100 TR screw chillers to stop Two Nos. 100 TR reciprocating type chillers.**



We were having two nos. reciprocating type 100 TR caustic chillers connected in series to chill dissolving lye at Zero Deg. Celsius.

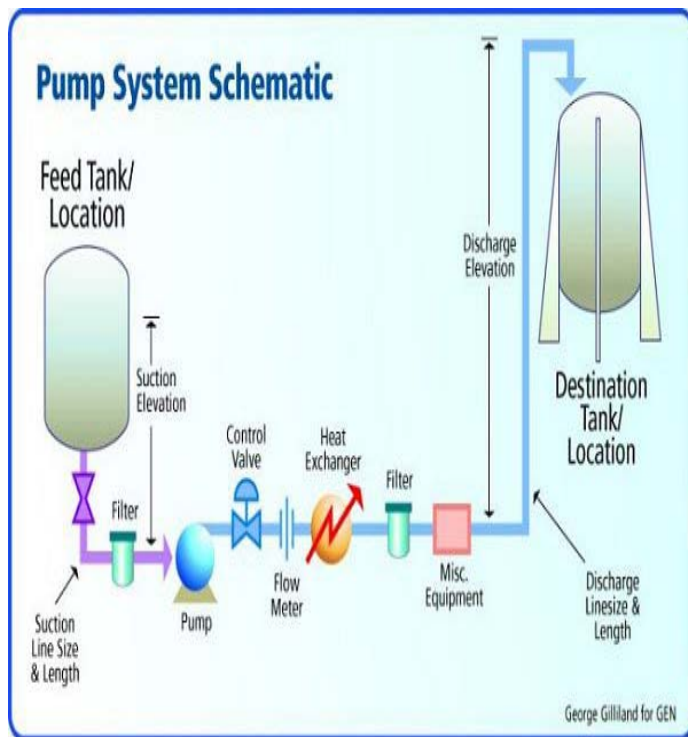
We have stopped these two chillers by one Screw type chillers of 100 TR capacity which can produce the same refrigeration effect.

Power saving: 4.38 lakh kwh per annum

Investment: Rs. 36.00 lakh

Saving: Rs. 24.09 lakh per annum

**3. Micro-mapping of power and steam consumption to identify the losses.**



With a view to identify the losses at various stages in the pumping system (from source to destination) micro mapping of the pumping system was carried out.

Similarly we have carried out the micro-mapping of the steam system to identify the heat energy losses in the system.

Power saving: 3.65 lakh kwh per annum

Fuel Saving: 666 MT per annum coal.

Saving: Rs. 40.15 lac per annum.

Investment : Nil

**4. Installation of Variable Frequency drives on 6 nos. motors of dissolvers in Viscose Deptt.**



We were having star delta starter on two speed 80/200 HP motors of 6 nos. dissolvers in viscose department. We have replaced these star-delta starter and installed variable frequency drive for speed control as per the process requirement.

Power saving: 1.82 Lakh Kwh per annum

Investment: Rs. 40.23 lakh

Saving: Rs.10.04 lakh per annum

**5. Shift-wise monitoring of power consumption through Energy Monitoring system**

Indian Rayon ( a unit of Aditya Birla Nuvo Ltd. ) VERAVAL						
Date : 23/9/2008						
SHIFTWISE POWER CONSUMPTION OF VISCOSE DEPTT.						
( a ) Feederwise Power Consumption						
Sr. No.	Feeder/ Ckt. No.	Details of Major Equipments	Power Consumption ( Kwh/c			
			A Shift	B Shift	C Shift	
11	PP #23	Dissolver 5, Mixer 1 & 2, Gender(2 X 60HP), Slurry tran pump-1,2(2 X 25HP), Dissolver tran pump(2 x 20HP), Air curtain	564	547	516	
	PP #5	Ripening and Caustic room: Hot well pump,FO 1,2(2 x 40HP), Diss caustic pump steeping caustic(20HP), Pilot plant vacume (10HP) PHE(5HP), Diss lye caustic circulation pump(25HP), VHM tank agitator	446	448	433	

We are having PC based energy monitoring system. Power consumption of various deptt. was monitored on daily basis. Now we have started the shift-wise monitoring of power consumption to know the variation from shift to shift and analyze the reasons of variation. We have taken corrective actions based on the analysis and reduced the power consumption.

Power saving: 3.65 Lakh per annum

Investment: Nil

Saving: Rs.20.07 lakh per annum

**6. Reducing the running hours of Vapour absorption machines by optimizing the process temperature**



We are having 2 Nos. Vapour Absorption machines of 525 TR capacity to meet the chilled water requirement for the process. We have optimized the process temperature and reduced the running hours of the vapour absorption machines. This has resulted into remarkable saving in steam consumption.

Fuel saving: 3193.9 MT per annum (Coal)

Investment: Nil

Saving: Rs.96.36 Lakh per annum

**Other Major initiatives taken for energy conservation during the year 2007- 08**

**(A) Saving of Electricity :**

Sr. No	Description	Saving in lakh kwh	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
1	Replacement of old/less efficient cooling tower fans by most energy efficient FRP fans	2.45	13.45	14.50
2	Replacement of old/less efficient pumps by Energy efficient pumps.	1.25	6.87	6.20
3	Replacement of diaphragm valve with ball valve in old & New A.T.(69 Nos.)	1.27	6.97	7.60
4	Replacement of old and inefficient spinbath pump by Energy efficient pump.	1.40	7.71	12.00
5	Replacement of old and inefficient ( 21 Nos. ) motors by energy efficient motors	2.43	13.35	17.40
6	Replacement of Ordinary Tube lights by Asian E+ tube lights (1196 Nos.)	1.14	6.24	11.00
7	Provision of pot enclosures in Spinning for power saving due to reduction in air friction (2000 Nos.)	1.14	6.26	4.00
8	Replacement of single stage ejector by three sage ejector in Spinbath Department.	1.10	6.02	6.00

Sr. No	Description	Saving in lakh kwh	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
9	Replacement of old and inefficient High Frequency Transformers (18 Nos.).	3.15	17.35	45.00
10	Connecting coning machine motor to star (341 Nos.).	2.98	16.42	0.00
11	Modification in cooling water system to stop cooling tower no.10.	1.82	10.04	0.00
12	Reduction in compressed air pressure.	0.36	2.01	0.00
13	Replacement of under-loaded motors of dryer exhaust fans by lower HP motors (8 Nos.).	0.18	1.00	0.80
14	Reduction of 5 HP motors in dryer circulation fan with 3 HP motors (18 Nos.).	0.36	2.01	1.26
15	Up-gradation of cooling tower no.7	0.73	4.01	15.00
16	Modification in lighting system on spinning machines.	1.09	6.02	0.00
17	Stopping the loss of conditioned air from textile hall.	1.50	8.21	0.00
18	Switching off unnecessary lights.	0.73	4.01	0.00
19	Modification in the lighting circuit.	2.56	14.05	0.00
20	To minimize the chilled water loss.	0.55	3.01	0.00
21	Stopping of 10 HP motor of jet room in Spinning by getting hot water from Spin-bath.	0.55	3.01	0.00
22	Making common system of compressed air for PSY & CSY in place of isolated system.	1.46	8.03	0.00
	<b>Total</b>	<b>30.20</b>	<b>166.05</b>	<b>140.76</b>

### (B) Saving of steam :

Sr No	Description	Saving in MT	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
01	Improving the insulation of the steam pipeline in the various section of the plant.	729	4.01	5.00
02	Arresting steam leakages from plant.	729	4.01	0.00
03	To identify and remove the idle steam line in total Rayon plant.	365	2.01	0.00
	<b>Total</b>	<b>1823</b>	<b>10.03</b>	<b>5.00</b>

### Major Plans and Targets for energy conservation for the year 2008-09

Sr No	Description	Saving	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
1	Reuse VAM condensate in boiler feed instead of sending it to raw water tank.	2540 MKcal	17.92	0.00
2	Replacement of old and inefficient cooling tower pumps (15 Nos.).	9.15 Lakhs KWh	32.05	12.00

Sr No	Description	Saving	Savings (Rs.in Lakhs)	Investment (Rs.in Lakhs)
3	Replacement of old and inefficient chilled tower pumps (14 No.).	9.80 Lakhs Kwh	34.58	11.20
4	Replacement of old and inefficient soft water pumps( 5 nos.).	3.10 Lakhs Kwh	10.90	7.50
5	Preventing wastage of steam condensate by attending leakage in tank and recycling steam condensate to PHE.	438 MKcal	2.00	0.00
6	Replacement of non-functional steam traps.	854 Mkcal	3.90	2.00
	<b>Total :</b>	<b>3832 MKcal, 22.05 Lakhs Kwh</b>	<b>101.35</b>	<b>32.70</b>

### ***Environment and Safety***

The unit is committed to preserve its environment and safety of its employees. Following major improvements have been made during last three years:

#### ***a) Water Effluent***

The effluent from various section of industry is led to the common effluent treatment plant. The acidic effluent flow are neutralized by addition of lime slurry and then fed to two zinc clarifiers for effective removal of zinc. The overflow from clarifier is fed to the mixing chamber where the effluent from other two drains also joined. The mixed effluent is then pumped to suspended solid clarifier. The overflows flows into a holding tank, from where it is disposed off to sea creak.

The quality of this treated effluent will within the prescribed norms of GPCB.

#### ***b) Air***

Regarding control of air pollution the company has installed ESP & Bag filter in power plant & boilers, scrubbers in acid plant & caustic plant for dispersion of process gas. The industry has provided a stack of 52.5 mtrs height. The company is regularly monitoring the all polluting parameters of stack & also the ambient air quality surrounding the industry.

All the gaseous emission are always found well within the norms prescribed by GPCB norms.

#### ***c) Solid waste***

Mainly lime sludge is generated & disposed as a solid waste in low lying land area. Our industry has got ISO 14001:2004 , OHSAS 18001:1999, RC 14001:2005 and ISO 9001: 2000 certification, won the Greentech Award (Golden Award) for environment & we are committed to follow all the guidelines as per ISO standards.

**Submitted by: Anupam gupta, Senior General Manager (VFY – Engg. & WCM)  
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